Needs: Powerpoints: [math and fractions and so on.ppt](file://localhost/Users/mroddy/COURSES/%20TEED%20521/POWER%20POINTS/math%20and%20fractions%20and%20so%20on.ppt)

[Fractions NCTM Article Presentation.ppt](../../POWER%20POINTS/Fractions%20NCTM%20Article%20Presentation.ppt)

TEED 521 – Math Methods

3rd – 5th Grade Session – Five Hours

Preview: The Factor Game

Amazing Math Facts!

The role of algorithms in mathematics education

Concepts or Procedures. Which comes first?

Chicken & Egg. The role of manipulatives in learning

Concrete Experiences => Abstraction => Skill

Pattern Blocks & Pentominoes

Play the Factor Game using the NCTM’s Illuminations utility:  
NCTM Illuminations > Activities > **Factor Game**:  
<http://illuminations.nctm.org/ActivityDetail.aspx?ID=12>

Play 1 game against the computer in order to demonstrate. (Remind the Ss to be thinking like Ts, that is, what LTs might I be working on if I chose to use this instructional activity.)

Get a volunteer to play one game against you.

Play the class against the computer.

Discuss possible LTs. Talk about ways to modify the game in order to differentiate for various needs. [Possible LTs: compose & decompose numbers into their factors, multiplication, division, problem solving (?), number sense. Building toward procedural fluency with mult. and div.

Demonstrate another site that could be used to facilitate practice:

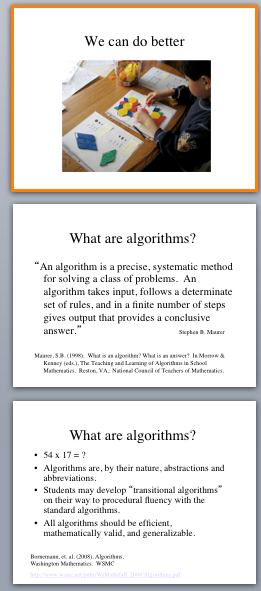
Arcademics: <http://www.arcademics.com/>

IXL (<http://www.ixl.com/>)

And mention/show the newly discovered site that supports the Common Core State Standards: CCSS Math: <http://ccssmath.org/> (Click on the “Resources” tab.) (Try 6th Grade > 6.RP.1.)

Amazing Math Facts

Use your Power Point [[math and fractions and so on.ppt](file://localhost/Users/mroddy/COURSES/%20TEED%20521/POWER%20POINTS/math%20and%20fractions%20and%20so%20on.ppt) ] to do a couple (or so) of things. First, I want to convey that math can enable understanding of some fascinating and important facts and concepts – things about our world that enable more effective life…. This might be a time to show them the book, “Rethinking Mathematics: Teaching Social Justice by the Numbers.” These slides bring you one where they are asked to divide 1.5 by 1/6. This leads to a discussion of how we divide fractions. Not many, if any, of us really know why we invert and multiply. It’s just a thing we recall that we are supposed to do. Is there anything wrong with that? (There is.) This leads to a discussion of the role of algorithms in math education.



Here are the next three slides:

Show them where to find the Very Useful article:

“Algorithms” by Bornemann, et. al. (2008). In

Washington Mathematics. WSMC

<http://www.wsmc.net/pubs/WaMath/>

fall\_2008/Algorithms.pdf

When you get to the 3rd of these slides, have someone do the problem (54x17) on the board in the traditional format, and then you do the same problem using partial products.

In the trad algorithm the emphasis and advantage is on procedural fluency.

With partial products the emphasis is on conceptual understanding. (note the important role of a clear understanding of place value.)

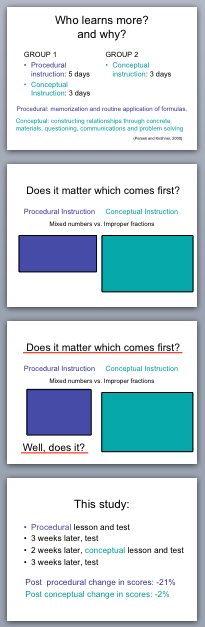
You can also do a 3 digit addition problem if you like, in this fashion, with the trad algorithm and then with partial sums.

Here’s a mistake you might see on a 3rd grader’s paper: 74

+21

911

they added 7 & 4, got 11, wrote it down, added 7 & 2, got 9, wrote it down and went out to recess. It’s a call for Help!

So how do we teach in order to get kids to construct their conceptual understanding AND build procedural fluency?

First, a simpler question: Does it matter whether we start with the concept and then build the skill or should we start with the algorithm and let them use that to build their understanding of the concept?

Ask them to consider. Turn & Talk.

Turn on your PowerPoint: [Fractions NCTM Article Presentation.ppt](../../POWER%20POINTS/Fractions%20NCTM%20Article%20Presentation.ppt)

Here is the heart of it: